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ISSUE

59

2022

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# Mining

ZIMBABWE

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& TECHNICAL FOCUS

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EQUIPMENT AND TECHNICAL FOCUS

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# When to Buy or Rent heavy equipment



**Y**ou've decided it's time you need some heavy equipment or trucks. Maybe you've got some big contracts coming down the pipe, you're growing or

expanding your company's capabilities, or you just need to replace your current heavy equipment. So how do you decide when to buy equipment and trucks and when to rent what you need?

With pros and cons to both renting and buying, it pays to evaluate your company's current situation and capabilities (financial and otherwise), your future plans, and carefully consider which method of acquiring equipment will be most advantageous to your business – and which is also simply going to make your life easier. Certainly, initial cost is a major factor in the decision process, but it's not the only one – there are several things to consider when it's time to gear up – usage, availability and more.

Here's an overview of some of the things you should bear in mind before deciding when to buy and when to rent equipment.

## 1. Current financial situation

This seems like the most obvious factor to consider – do you currently have the capital to buy or is renting a better option for now? But you should look beyond your current situation and project your costs over several months or years. Although buying may be a larger one-time financial outlay, the cost of renting can add up quickly, and over a long period of time can end up costing you more – especially if the equipment isn't being used for the entire rental period. And don't forget: when you own, you can see a return on your investment when you sell.

You can reduce the initial financial impact of buying a piece of equipment in many different ways:

**Buy good quality used equipment –**

when you rent, you are often paying for the newest equipment with the latest technology; purchasing well-maintained used equipment can be cheaper than buying new equipment and may be more cost-effective than renting over the long term

**Finance your equipment purchase** – give your company some extra financial breathing room by financing your equipment purchases and keeping your capital to run your business; with low financing rates, your payments could even be lower than rental payments.

## 2. Cost of ownership vs cost of renting

It's also important to estimate the cost of equipment ownership versus the cost of renting equipment. With ownership comes maintenance and operating costs, insurance and other fees such as government licensing, and those costs obviously vary from machine to machine. Renting is generally an inclusive cost, but given that a rental company has to turn a profit, you should consider that your rental fees will include the purchase price and the cost of ownership, both marked up. You will probably have to pay to transport the equipment to and from the rental store as well, over and over.

Fuel is a cost that is common to both owning and renting and needs to be considered for both. Roughly, one-third or more of your total expenses will be for the cost of fuel.

Talk to your financial advisor about the possible tax implications (or advantages) of buying or renting equipment for your business. Tip for U.S. equipment owners: you may be able to avoid paying capital gains tax when you sell and buy equipment for your business.

## 3. Length of project or job frequency

Of all the things to consider, project length or the frequency of jobs on the calendar could be the deciding factor in whether you rent or buy equipment. If it's a short-term job, or you need a specialized piece of equipment for a one-off job, then renting may make more sense. The risk, of course, is that if the machine isn't being used for the entire time it's rented due to changes in the project schedule or unforeseen hold ups, then you're spending money on a machine that's sitting and waiting, not making you money.

## 4. Equipment availability & usage

The big advantage of owning your own equipment is that it's available to you 24/7 – “if you own it, you control it”, as the saying goes. You can react to unexpected changes in projects or project schedules, take on jobs at a moment's notice and complete projects with less downtime.

Before you decide whether to rent or buy, you should weigh the potential risk of a rental company not having the machine you need when you need it. Owning can be a plus to potential clients too, who see it and know you're not only equipped to take on their job, but are a going concern and a stable, trustworthy business. working on a long project, or if you've got several jobs on the horizon, then buying probably makes better sense given that rental costs add up quickly the longer a job goes on. And a multi-purpose piece of equipment (loaders, excavators, skid steers, forklifts, trucks etc.) that can be used for various projects is a great asset on any job-site.

## 5. Fleet management and inventory control

Managing your equipment is also something to consider. If you have the skills and the time, you can save money over the long haul by buying some or all of your equipment and taking care of insurance, maintenance, etc yourself; if you don't, you may want to pay a little extra to rent. You'll know where it is, who's running it, and you can schedule jobs and equipment accordingly.

For shorter-term jobs, you may want to consider renting, but buying gives you added flexibility. Let's say you project that you'll need a piece of equipment for three months. If the job extends for another two months, you have the machine at your disposal. If the job ends and you decide you don't need it, we can help, you sell it again at another upcoming auction and recoup some of your investment. The frequency of our unreserved auctions in different locations gives you a great ability to control your inventory, and even profit from the equipment you don't need anymore.





# Electrifying mining operations

**D**iesel-powered construction vehicles like excavators, wheel loaders and dozers jointly emit an estimated 400 million t of CO<sub>2</sub> annually, accounting for around 1.1% of global carbon emissions. Excavators in the 10 t-plus category represent an enormous 46% of these emissions. The mining industry accounts for up to 7% of all greenhouse gas (GHG) emissions, so controlling emissions relating to transportation is particularly important.

While heavy diesel vehicle emissions pose a risk to worker health in all mining operations, underground environments are riskier. These are typically tight and enclosed spaces where exhaust gases, like CO<sub>2</sub> and NO<sub>x</sub>, can quickly lead to hazardous situations for workers.

Accordingly, mines operating such vehicles require extensive ventilation systems to extract the exhaust fumes and ensure good air quality in workspaces. These electrically powered systems add significantly to the mine's overall energy consumption and operating costs.

To counter these environmental and health concerns, many industries – including mining – are introducing efforts to reduce vehicle emissions. In mining, the International Council on Mining and

Metals (ICMM) has committed to achieving net zero emissions by 2050 or earlier.

Electrification will play a significant role in attaining this goal. Underground mining, in particular, is showing great interest in the concept of electric operational vehicles because of the more immediate benefits of reduced emissions, improved ventilation, and lower ambient temperature.

Still, mining vehicles operate at least two shifts daily (around 16 hours) in harsh and challenging conditions. Therefore, the technology in electric powertrains must be highly robust, powerful, and able to withstand these environments.

One of the sternest tests of the technology came at the Kittilä gold mine in northern Finland. Engineers successfully tested three underground electric mine vehicles – the Boomer E2 Battery, Scooptram ST14 Battery and Minetruck MT42 Battery – as part of the European Union's Sustainable Intelligent Mining Systems (SIMS) project.

The Kittilä mine typically does not face high ambient temperature underground, but specialists measured a reduction of 3°C when the mine used electric vehicles compared to diesel operation. This is a game-changing aspect for mines that have higher ambient temperatures.

## *Making the energy transition*

Electrifying a mine, like mining itself, is a process. Mining operators should seriously consider partnering with OEMs and system integrators to accelerate this process. Such a partnership applies to new vehicles and retrofit projects, like replacing a diesel engine with an electric powertrain.

Nasta AS, a leading distributor of Hitachi heavy construction machinery in Norway, is an example. The company is collaborating with ABB to convert heavy vehicles like excavators for electric operation via battery power or a direct cable connection.

With ABB supplying the electric powertrain components, the conversion procedure involves removing the diesel engine and retrofitting an electric motor and drive. It also includes an energy storage system and charging solution. A large, 24 t diesel-driven excavator consumes around 18 000 l of fuel annually, the equivalent of almost 48 t of CO<sub>2</sub> emissions. An electric upgrade eliminates these and other harmful emissions completely, including noise pollution. But the benefits are not just environmental – the electrified machines are also much more responsive, according to operators who tested them.



An electric motor provides instant torque, whereas an internal combustion engine takes longer to reach maximum torque.

Manufacturers of traction powertrains must actively accelerate decarbonisation by improving the components' energy efficiency and productivity. Such sustainability initiatives can only be credible and effective if the entire power-train system uses reliable and proven technology. With that in place, electric motors can reach 95% energy efficiency, more than double the efficiency of diesel engines operating in the optimum load range.

### Required infrastructure

Electrically powered vehicles require infrastructure to function, which could either support a direct power supply (such as through overhead catenaries), recharging onboard batteries, or a combination of the two. Specifying the most suitable type of infrastructure for the application is essential.

In a pilot project for the Aitik copper mine in Sweden, ABB designed and installed a 700 m catenary line for use by heavy-duty mining trucks. Predictions are that the project will save nearly 830 000 l of diesel

annually with a 2200 t reduction in CO<sub>2</sub> emissions. Greenhouse gas emissions also dropped almost 80% along the catenary route.

Electrification technology has already proven to reduce emissions in public transport vehicles. The Aitik mine project is one of many recent examples showing that industrial vehicles can and should follow suit. Therefore, mining operators should embrace the benefits of electrification to improve safety, lower costs, and reduce emissions.

## Preventive maintenance versus predictive maintenance – why they matter

**E**quipment downtime will not only set you behind schedule, but it can result in lost revenue. Equipment needs to be in top working order and on the job site to make the most of your investment. A vital part of achieving that goal is incorporating a regular maintenance routine into your business practices.

Completing maintenance on the equipment not only will help prevent unexpected downtime, but it also makes the equipment more efficient, leading to improved output and production quality. Well-maintained equipment will have a longer lifespan overall, as will its different components.

### What is preventive maintenance?

To ensure your fleet is up and running efficiently, you will need to take care of the machines. One way to do that is with preventive maintenance. This proactive approach to equipment maintenance falls between reactive and predictive maintenance and can help prevent unexpected breakdowns.

Simply, preventive maintenance is regular, routine maintenance based on proven best practices and identified intervals that give you the best chance of catching an issue before it starts. The main focus of this type of maintenance is to prevent equipment issues and downtime.

Preventive maintenance can occur at different intervals set within your business, like a daily list of items to check and then a more intensive list semi-annually and annually. These checklists, which are included in your machine's Operation & Safety Manuals, should include an

inspection, repair/replacement, calibration, and cleaning of the equipment and its different components – and when each should be completed (daily, weekly, monthly, etc.).

The machine will be down during these checks, so performing the maintenance before and/or after the workday is ideal for equipment currently in use on jobs. Preventive maintenance should be performed whether or not there are identifiable issues.

### What is predictive maintenance?

As technology continues to evolve, so should your maintenance practices. Equipment can now alert you when there's a potential issue before any downtime occurs. Having the ability to flag issues before ever looking at the machine can be a game changer – and you can do that with predictive maintenance.

As the name suggests, this type of advanced maintenance predicts equipment issues while the machine is on the job site and sends notifications for your team to address as needed, allowing you to prevent costly downtime.

Predictive maintenance uses real-time data from equipment with condition monitoring technologies to indicate potential issues before they occur. This proactive, data-driven approach assesses the machine's performance while it's operating, which reduces the downtime needed for unplanned replacements or repairs.

This type of maintenance requires machines and technologies with interconnected measurements and data

collection systems – along with team members who can analyze the data received from the machine. It's important to establish baselines for the equipment before you start using predictive maintenance so you can identify issues when the machine operates outside of those parameters.

Predictive versus preventive maintenance The best maintenance plans include a mixture of both predictive and preventive practices. While both maintenance strategies focus on being proactive to reduce unexpected downtime and equipment failure, there are some distinct differences between the two. Unlike preventive maintenance, predictive maintenance:

- **Can be performed while the machine is in operation**
- **Occurs as-needed based on data, instead of following a schedule**
- **Has targeted downtime if an issue is detected**
- **Focuses on real-time equipment data – not solely on an inspection**

Instead of an operator or technician signaling that there's a red flag with the equipment, the data being sent will show when there's a potential issue. The goal of predictive maintenance is to remotely identify issues before they turn into larger ones.

### Keep equipment on the job site

Both preventive and predictive maintenance position you for success because it gives you the best chance of catching issues before they start and potentially lead to bigger problems.



# Epiroc's

## new long-hole production drill rig automatically tracks and evaluates performance

**E**piroc's new long-hole production drill rig for medium to large-sized drifts, the Simba E70 S, offers automation features and ideal drilling quality. It also provides Epiroc's step-by-step program that continuously improves how the machine is utilized in the mining process.

The Simba E70 S can track and evaluate its performance, then optimize accordingly. This is made possible by production reporting, the first step in Epiroc's optimization program.

"Our new Simba E70 S delivers greater value to our customers' operations through improved productivity, with zero compromises on quality," says Sarah Hoffman, vice president of sales and marketing at Epiroc's underground division.

The Simba E70 S is part of Epiroc's Smart series and can also be delivered with the optional battery-electric driveline for reduced environmental impact and

healthier underground conditions.

The real value is created while the machine is producing metres. That is why the ability

to find the most optimal way or if there is room for improvements," says Olav Kvist, global portfolio manager production drilling at Epiroc's underground division.



to track effectiveness and utilization – if Simba E70 S drills and produces metres when active – is one of its main advantages.

"After tracking effectiveness and utilization, we compare the result to global benchmarks. In that way, we can easily analyze if the machine is being used in the

most optimal way or if there is room for improvements," says Olav Kvist, global portfolio manager production drilling at Epiroc's underground division. While the optimization journey progresses, the operator's role changes as well. "As the process becomes more automated, the operator goes from running the Simba E70 S to supporting it when running in automated mode, upskilling and making them more of a process operator," says Mikael Larslin.



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# 10

*things you need to know about air compressor pressure*

# 10



Applications, regulations, treatments – there's plenty to consider when understanding pressure requirements.

## 1. Finding the 'sweet spot'

Compressors must provide the right amount of pressure – or force – needed to complete the required process. Not too little, or too much. Too little pressure means pneumatic tools won't work, whereas too much pressure can damage the equipment, waste energy, and raise operating costs.

## 2. Unique conditions

Every project is different, and not every application requires the same level of pressure. Geothermal projects, for example, require deep boreholes to be drilled into the earth, which can only be achieved by using compressors with a pressure output of 35 bar. Abrasive blasting projects, on the other hand, may only require 10 bar of pressure.

## 3. Setting the PACE

Those requiring varied pressure levels for different aspects of a project can benefit from using a medium compressor fitted with PACE, or a large compressor with Air Expert. With Atlas Copco's patented technologies, operators can adjust the pressure while the compressor automatically regulates flow. Operating handheld tools, then tackling a shotcrete application an hour later? No problem.

## 4. Raising the bar

In the drilling industry, there is heightened user demand for compressors that prioritize speed and efficiency. This demand can be met using high-pressure compressors, such as the DrillAir – designed to maximize efficiency by drilling faster and helping to save valuable time and costs.

## 5. Going with the flow

For sufficient pressure, operators need consistent flow. A large air compressor, for example, takes the hammer downwards by applying downward pressure while the flow keeps it rotating. For optimal performance, the goal should be to supply an application with the proper airflow at the correct pressure and treat the pair as inextricably linked.

## 6. Boosting your efforts

For projects that need pressure above 35 bar, boosters are available. Atlas Copco compressors come in oil-free or nitrogen variations and can reach anywhere from 69 bar to 345 bar. They have extensive pressure inlet/outlet, and flow capacity for a wide range of applications – even in the harshest and most demanding conditions.

## 7. VSD is key

Variable speed drive (VSD) compressors are a smart choice when the demand for air varies and allow for continuous flow rate regulation. VSD compressors can operate at very low delivery pressures while still maintaining the air system's required

minimum working pressure and also deliver more consistent discharge pressure for all the compressed air applications throughout the facility.

## 8. Tried and tested

At Atlas Copco's pressure-containing systems are first put through a leak test, and then a strength test. The latter puts the compressor at 110 percent of the system's maximum operating capacity where it is kept under pressure in order to monitor integrity and safety. All components are also manufactured in line with the strict industry standard of pressure regulation – the European Pressure Directive.

## 9. Preserving quality

A holistic approach is needed to maintain pressure quality as different components can negatively affect performance. Filters, dryers, and the compressor's piping and valves all need to be considered and maintained appropriately in order to keep pressure working in tip-top shape.

## 10. A tailored outlook

Ultimately, a systematic approach should be taken to select a compressor in line with the needs of the application. When the role of pressure in a process is clearly defined, finding the system that will be the most profitable and efficient becomes simple.



# Five ways contractors can use mobile apps to improve equipment management



**K**eeping tabs on dozens or hundreds of pieces of rental equipment on a job site, including what's in use, what needs to be returned, and what's awaiting delivery or pickup, is a big job. When construction project timelines are running, contractors see using mobile technology as an important tool to make sound decisions and take action about equipment resources. United Rentals has outlined how contractors can use equipment rental mobile applications to improve fleet management, keep projects on schedule, and boost job site performance.

Equipment rental mobile apps bring consumer-like experiences to construction teams and make everyday fleet management tasks easier. They allow contractors to rent and manage equipment, including excavators, trenchers, aerial work platforms, backhoe loaders, and more no matter where they are located. Mobile apps enable workers at job sites to keep informed while on the go and empower them to take control of equipment resources to get work done.

"Mobile applications help contractors create high-performing job sites by allowing workers to know quickly what equipment they have, where it is located, how much they are paying for it, how often it is being used, and when they need to return it," said Paul Maddison, director of digital innovation at United Rentals. "Construction teams can see how their fleet is performing in real-time and make

the right equipment moves to keep project performance on track and save money."

## ***Five ways mobile apps can improve worksite equipment management***

### ***Find and order equipment***

Contractor teams can use mobile applications to browse, search, and rent equipment inventory directly from a mobile device on a 24/7 basis whether at the job site, office, or home. Mobile apps can show a company's contract pricing during the order process and provide users with confirmations after equipment rental orders are placed.

### ***View all equipment***

Construction teams can use their mobile devices to view all their rented equipment listed by status, cat-class, and job site. Mobile apps can include search capabilities to locate specific pieces of equipment. They can help contractors close the "communication chasm" that can occur between an equipment order and when the machine arrives on the job site. Mobile apps provide visibility into order delivery status from pending to en route to delivered.

### ***Control rental equipment***

Mobile apps can allow workers to extend or off-rent equipment with a few clicks. Teams can use their mobile devices to schedule equipment pickups and receive

confirmations which decrease the risk of discrepancies in returning equipment. The apps can be used to adjust rental dates on equipment, providing contractors with leniency windows to find ways to reduce costs. For example, if a company has multiple scissor lifts on rent and work is winding down, a contractor can decide which ones to return in order to right-size its fleet and minimize rental costs.

### ***Monitor and manage equipment***

Worksite teams can employ GPS technology from their mobile apps to know the precise location of rental equipment at all times. They can track the utilization of telematics-supported equipment in real-time and use this actionable data to make decisions on how best to deploy their fleet and save money on an underutilized fleet.

### ***Request service***

Mobile apps can allow teams to request service on rented equipment from anywhere, including the job site. In the app, users select the equipment issue, such as tire or hydraulic leak, add descriptive information regarding the issue, and attach equipment photos. Users receive a service confirmation number which is also sent to the local branch of the rental provider, which will then contact the contractor to schedule service. From a mobile app, users can see all their active equipment service requests in the app dashboard.





# VENTILATION PLANNING

**T**he relationship between ventilation pressure and quantity follows a simple square law, pressure is proportional to quantity squared, or for an airway pressure drop equals a constant, known as the resistance, times quantity squared.

By measuring pressure and quantity flowing in airways underground, values of resistance can be calculated for all individual lengths of roadway or for examples of roadway which are "typical" for a particular mine, seam or area. Alternatively, typical resistance values can be calculated for given airway types and sizes using standard "friction factors" affected by the roughness of the surface, etc.

Using the measured, calculated or assumed values, a ventilation model for the mine can be built-up as the combined resistance of roadways connected together in series or parallel, and the overall mine resistance can be calculated. Additional resistances have to be added to allow for shock losses at changes of direction, junctions, etc.

Once a model is constructed, the airflows which would result from a given fan can be calculated if the fan performance curves are known. Alternatively a fan duty can be calculated to provide desired flows around the mine based upon the determined mine resistance.

The most accurate models will be those which use actual measurements rather than typical or theoretical values.

"Solving" such a model for a large mine is a very arduous and time consuming process if done manually, especially as it can only be done by guessing a result then following an iterative process closer and closer to a correct solution.

Fortunately there are now computer programs available to carry out this process once the model has been constructed, Ventsim being the most widely used in Australia. Such modeling is done separately from mine planning models, but must be done in conjunction as both need to model the same mine layout and results from either may require modifications to the other.

Creating an initial model is a time consuming exercise, requiring ideally a large amount of underground measurement, reduction of results and construction of the model in the computer. For a number of reasons it is seldom that a model matches exactly the conditions in the mine and most models include some degree of "adjusting" often based on little more than intuition and the fact that it works (unless one is prepared to invest a large amount of time and money on very detailed measurements). To this extent, modeling has aspects of being an art rather than a science.

One difficulty in obtaining accuracy is that measurements normally have to be taken when the mine is working, at least to some extent. The measurements take a considerable time and most mines cannot afford to stand while such measurements are taken. In addition, a mine is continually

changing – panels extend and retract, longwall faces may have chocks back or advanced to the face, face ends may be open or partly blocked with coal or brattice, roadways deform under stress, mobile machinery moves around, etc. Differences may be small, but it is unlikely a mine circuit is the same from one day to the next. Even the weather will have an effect on air density.

The degree of accuracy and detail has to be decided as a lot of time and money can be spent measuring and modeling detail which is not really necessary. It is often the case that projections of an order of magnitude rather than absolutely correct values are required, especially since future layout details more often than not differ from original plans.

At times complex sections of mine workings can be represented in a model as a single resistance roadway without including all the detail, provided there are no changes within that section. The pressure drop in such a section is easy to measure, but a representative flow may be difficult to define unless it is constant throughout.

Once a model has been constructed, it is important it be kept up to date, even if not being used. If this is done, it is ready for instant use if required. If not kept up to date, major work may be needed before it would be of use, a factor that could have serious consequences in the event that it was required to examine options in the event of a mine emergency.



## Main Fans

Note that the following is written using fan in the singular for the main ventilation. In fact where a large fan duty is required it is common to use 2 or 3 fans in parallel to provide the duty. The reasons for this are:

Fan duties are becoming very large and the physical size of fans that could meet such duties singularly become impractical

With multiple fans partial ventilation can be maintained in the event that one is stopped, a feature which is considered very beneficial.

The main fans which ventilate large mines are major power consumers, having large motors which run virtually continuously, usually only being stopped for maintenance purposes. Great care is therefore required in design and specification in order to avoid unnecessary expenditure. The fan duty required often varies greatly over the life of a mine as the workings become more extensive and it is usually best to make provision for varying the fan performance. This can be done by installing inlet vanes, which restrict the fan inlet size, or by varying the fan speed. Speed can be varied by changing motors, by use of gears or by use of variable drive systems (VVVF drives are being increasingly used).

Air quantity flowing at the main fan is large and unless care is taken with the design of airways and ducting considerable power can be wasted in overcoming the resistance and shock losses which result. Airways should be as straight and smooth as possible and sudden changes of direction should be avoided as far as practical. At the same time there is a requirement that provision be made to protect main fans from damage in the event of an explosion. This is done by mounting the fans away from the direct line of the main airway, which usually involves a 90° deflection (or close to it), and providing a device in line with the airway that is designed to fail under pressure and release the explosion pressure (e.g. doors or a weak section of duct).

Airways should be kept as clear as possible, though it is common for main return shafts to involve winders with the associated shaft fittings.

### High air flows in shafts can cause problems:

Because of the effect of turbulence on

stability of cages, counterweights or ropes

If shafts are wet high velocities can result in water being held in suspension causing unstable flow (air velocities between 8 and 12 m/s should be avoided; above this range water will be carried up the shaft and will have to be dealt with at the fan site and part of the fan power cost will actually be for pumping water).

As fan duties become more onerous, the ability to provide ventilation using only fans on the surface becomes increasingly difficult, especially for mines with coal liable to spontaneous combustion. The use of "booster fans" sited underground and acting in series with the surface fan will become more common. While such strategies may be preferred they raise difficulties in relation to interlocking surface and underground fans, avoiding recirculation and separately ventilating underground fan motors to ensure gas-laden air does not pass over the motor(s).

## Main Airways

As mines become larger and production rates increase the quantity of air flowing in the main intakes becomes large and ventilation effectiveness and cost is usually the main factor deciding the number of main airways required. For other purposes it would often be the case that only two intakes, one each for coal haulage and personnel/materials transport, and one return are necessary. Additional headings are to reduce the resistance to air flow and/or to reduce air velocities. For ventilation, the more airways the better, but after a point the incremental benefit is small; for development costs, the fewer the better – the best compromise is required.

### *Air velocity also has to be considered where air flows are large relative to:*

#### *Safety and comfort of personnel working in windy locations or walking against high flows*

#### *Raising of dust and its ability to settle, mostly in conveyor and transport roads*

The requirement for high air flows and, increasingly, high pressures dictates a high standard of ventilation control devices. Where access doors are required for personnel or machinery at least double doors forming air locks are required with pneumatically or hydraulically operated doors becoming more common.

Minimising leakage through stoppings,

doors, etc is important, but mostly from an efficiency point of view. Removing leakage actually removes parallel air paths and thereby increases overall mine resistance and the result may be that minimal additional air is generated at the face areas within the mine.

Main airways should be mined as straight as possible and kept as free of obstructions as possible, a factor often overlooked when siting major items of equipment. At least the presence of such equipment should be taken into account when ventilation planning is carried out.

A further issue to be considered in mine design and ventilation planning is the siting of large motors (e.g. main gate conveyor drives) and other heat generating sources (including high powered diesel equipment) particularly in mines in Central Queensland that experience both a high geothermal gradient and high ambient temperatures (and humidity levels) through summer months. The application of air cooling systems is being increasingly favoured in such environments.

## Secondary or Panel Airways

There is a tendency for development panels to be mined for longer distances, in order to maximize the length of longwall panels, without increasing the number of headings. At the same time production rates from longwall equipment have increased. The result, combined with increasing face lengths, is ever more arduous ventilation requirements and high ventilation pressures as noted previously.

Airways around longwall face ends are also frequently obstructed by equipment, windrows of coal, brattice wings and secondary support all of which hinders air flow.

Flows and pressures at regulators can be very high and provision must be made in some cases to allow the safe passage of personnel through these devices (e.g. an enclosed steel tunnel with air lock to one side of the roadway).





# How to

## improve your heavy equipment fleet maintenance programs

**W**hether you own or lease your heavy equipment, it's important to maximize the lifespan of your investment. Taking a proactive stance on maintenance ensures you get the maximum return on your investment (ROI) and minimizes downtime to keep your team on schedule. Creating a strong preventive maintenance schedule based on asset usage gives you visibility into any potential issues regarding your equipment and allows you to take action immediately.

Additional ways to improve your heavy equipment maintenance strategy are through leveraging data from other aspects of your fleet, like inspection results and telematics data. Every bit of data you can garner from your fleet will help you improve your operations, maximize asset lifespan, and reduce the risk of injury.

### Scheduling and automating preventative maintenance

Creating a comprehensive preventative maintenance schedule allows you to stay proactive and keeps you apprised of potential issues. Heavy equipment preventative maintenance scheduling can be as simple as following OEM specifications, mileage, or service hour intervals, or it can be tailored to specific equipment based on insights uncovered through service histories. While the latter may be more difficult if you're using paper and spreadsheets to track data, it is one of the most efficient and precise ways to ensure you maximize the lifecycle of your equipment.

Preventative maintenance schedules can also be built out and workflows automated through fleet management software (FMS). Send notifications directly to your inbox for regular service items using FMS. Notifications help you keep tabs on the health of your assets to maximize safety and uptime on the job site. Additionally, FMS stores all your fleet assets' service histories for you, making it easy to track down recurring issues.

### Tracking meter and hour readings with telematics

Knowing what's going on with the mechanics of your heavy equipment can give you a better understanding of the health of your assets. Telematics provides visibility into your equipment by automatically capturing data from meters. Without telematics, operators must manually record odometer readings, delaying communication between the operator and manager. Worse still, critical issues with your equipment aren't identified immediately, which could cause unplanned downtime and expenses.



Integrating a telematics device into your FMS provides you with real-time data including odometer readings and diagnostic trouble code (DTC) alerts. This extra data layer can help you better plan future maintenance and alert you to immediate issues.

### Expediting repairs with inspection results

Heavy equipment inspections have a wealth of benefits. Not only do they keep you compliant, but they also help your operators communicate any asset issues with you. Daily vehicle inspection reports (DVIRs) help many fleet managers stay compliant and aware of issues, but due to paper-based systems, information from the job site isn't received quickly. Electronic DVIRs (eDVIRs) gives operators a fast, easy way to complete inspections and communicate issues to their managers. Unlike paper inspections, eDVIR results are uploaded instantly, allowing you to receive inspection results in real-time and stay ahead of issues. eDVIR is also customizable, so you can create different types of inspections for all of your asset types.

FMS gives you the ability to customize notifications so that you are alerted when certain inspection items fail. Managers are promptly alerted to issues so maintenance can begin quickly, leading to reduced downtime and risks on the job site. When developing a heavy equipment maintenance schedule, routine inspections ensure you are aware of any potential issues so you can get assets in the shop quickly for repairs.

Determining the total cost of ownership To get the best understanding of your fleet operations, it's important to determine your fleet's true total cost of ownership (TCO). Controlling fleet expenses, including heavy equipment, is a never-ending task for managers and administrators. Sorting through multiple spreadsheets of data to calculate TCO is nearly impossible and can result in flawed numbers.

FMS takes the guesswork out of data analysis by automatically calculating your fleet's TCO. Because your heavy equipment is expensive, it's vital to manage costs, risks, and depreciation to maximize asset lifespan and overall profitability. By having your fleet's total cost of ownership immediately accessible, you can make informed, data-driven decisions about your fleet.





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Account Name: Association of Mine Surveyors of Zimbabwe

Account Number: 11990675696

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Currency: USD

Swift Code: MBCAZWHX

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Branch/Sort Code: 18510

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## How Advanced **Lithium-Ion Battery Technology** Is Being Embraced By The Mining Industry

**T**he mining industry has traditionally utilized diesel-powered equipment as its most resilient option regardless of the heat, noise, and unavoidable pollutant emissions it creates, all of which require extensive ventilation systems to ensure worker health and safety.

However, due to advancements in battery technology, lithium-ion batteries can now take on both the heat and cold of job sites. This new technology helps to prevent disruptions to the battery and greatly increases its potential for use in various applications.

This means more industries – including mining – can embrace electrification, and modern battery-powered equipment can now withstand the inevitable harsh climates of underground mines.

There are, however, several factors to consider when it comes to ensuring that a battery is durable and rugged enough to be used underground.

Engineered for a powerful performance Underground mines can be extremely hot and humid places to work. So much so that some people can't comprehend the idea of batteries being able to withstand

those elements. However, equipment manufacturers and end users shouldn't make the mistake of discounting battery power.

Today's lithium-ion batteries are being engineered with durability as a top priority. Although factors like excessive heat, strong vibrations, and exposure to moisture were previously disruptive to battery power, manufacturers like Vanguard are developing batteries that deliver optimal power performance in the harshest of conditions.

Testing capabilities for batteries have improved so battery developers can now expose their batteries to severe elements in order to ensure that they can deliver powerful, consistent performance when it matters most. Vanguard batteries are designed to operate from as low as -20

degrees C to as high as 70 degrees C.



### The brains of a modern battery

Machines used for underground mining must be able to transport heavy loads for many hours on uneven terrain while withstanding intense heat, moisture, dust, and vibrations. Batteries can deliver a seamless and consistent performance in spite of these conditions thanks to the battery management system (BMS).

The BMS is the brain of the battery. It helps to monitor a variety of functions beyond just the temperature of the battery. It is also constantly monitoring charge and discharge currents and the voltages of each individual cell bank to ensure that the battery stays within its operating range.





A BMS enhances the safety and durability of a lithium-ion battery by protecting against over-voltage and low voltage, short circuits, and cold temperatures to help maintain battery life in harsh conditions.

Since the primary safety concern with lithium-ion batteries is a thermal runaway event, the BMS is a critical component. When a lithium-ion battery exceeds its maximum allowable temperature range, it can go into a thermal runaway event where the temperature rises rapidly, releasing the battery's energy. However, proper BMS programming will prevent a battery from operating near these limits to ensure an event does not occur.

### Designed to be durable

A poorly designed battery with incorrect housing in an unsafe or uncontrolled environment will have reduced battery safety, health, and power capabilities. Without a sturdy protective casing that is built to be durable and tested to withstand extreme temperatures, impact, vibration, moisture, and dirt, the battery could suffer internal degradation and damage to the cells during operation.

Vanguard battery packs are ruggedly constructed to prevent damage to the internal battery cells. The battery cells are secured within the battery casing and tested to harsh vibration profiles to ensure

there is no risk to safety or performance.

Careful spacing of the cells within a battery allows for proper cooling and avoids any issues with a single cell impacting those around it. Additionally, ensuring that the battery casing is sealed in an effective manner protects the electrical componentry from impact, dust, and moisture. The Vanguard battery range has IP66 protection, safeguarding it from dust and moisture.

### Improved working conditions

Additional heat production and noise are commonly associated with fuel-powered engines and add to the already challenging working conditions in underground mines.

Battery-powered machinery runs cooler and quieter, creating a more comfortable environment for mine workers while also

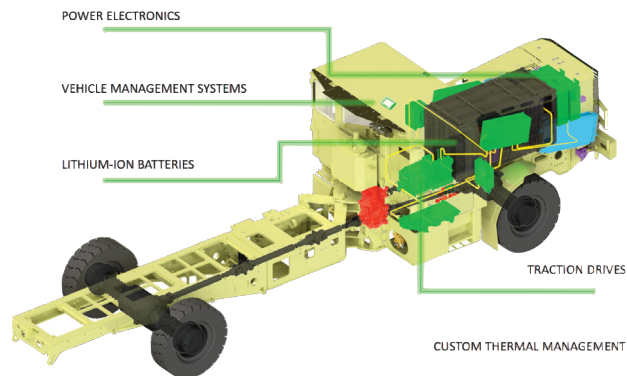
offering enhanced health and safety benefits.

### An electric future

Research and development efforts over the past few years have helped to make lithium-ion batteries more suitable for use in underground mining and other extreme environments.

With proper system management, lithium-ion batteries can combat the demanding conditions of mining, such as heat, moisture, and vibration, while also providing the performance needed to power underground machinery.

As technology around lithium-ion batteries continues to advance and more OEMs look to expand their battery power offerings, experts anticipate that more and more industries, including mining, will go electric.

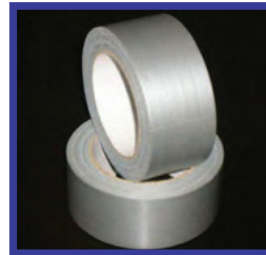
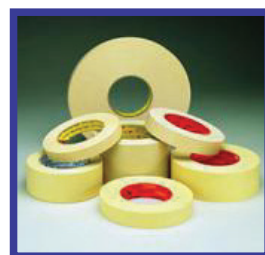


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# The newly launched Dinson Iron and Steel project

**P**resident Emmerson Mnangagwa earlier this month commissioned the first phase of the Dinson Iron and Steel project in Manhize. The first phase of the project is expected to have an annual turnover of US\$600 million.

The Dinson Iron and Steel Company (DISCO) Steel Plant is one of the Tsingshan Group of China's mining projects in Zimbabwe. Tsingshan Group is one of the second Republic's biggest investors with various other projects such as Afrochine Smelting (Pvt) Ltd in Selous, Mashonaland West which is into chrome smelting and Dinson Colliery (Pvt) Ltd in Hwange, Matebeleland which is into coke production. All these projects are interlinked as both ferrochrome and coke are required in steel production.

The coming in of Disco has been dubbed as another milestone towards the successful development of the mining sector and the national economy at large.

"This is another step forward as we work

towards the achievement of a USD12 billion mining industry by 2023 and ultimately feed into the national vision of Zimbabwe becoming an Upper-Middle Income Economy by the year 2030," according to the Minister of Mines and Mining Development, Hon Winston Chitando.

As outlined in the National Development Strategy 1 (NDS1), some of the strategies being employed to grow the mining sector include attracting funding, enhanced exploration, the opening of new mines, re-opening of closed mines, expansion of existing mines as well as improving levels of local mineral beneficiation. This project is therefore a clear testimony of the government's commitment towards value addition and beneficiation of minerals. Since the closure of ZISCO Steel, there has been very little production of steel in the country. Currently, only Steelmakers are producing steel.

## About Dinson Iron and Steel project

The investment span of the project is from exploration to mining, beneficiation, and

value addition. Therefore, covering the entire iron and steel value chain which the company says will result in the creation of jobs, infrastructure development of participating provinces, and generation of foreign currency resultantly contributing towards the economy of Zimbabwe.

DISCO (Pvt) Ltd was granted a Mining Special Grant Certificate (SG7126) in March 2021 which gave them the permission to explore and mine iron ore along the Mwanesi Range.

DISCO Pvt Ltd says it is going to invest a total of US\$ 1 billion for the whole project. This amount will be invested for a period of 5 to 7 years. However, this amount can be doubled depending on other emerging business opportunities. On the other hand, DISCO is going to attract other supporting partners within the zone which will see an escalation of the envisaged investment.

*Continued on the next page*



This integrated Iron and Steel manufacturing plant will be designed to manufacture carbon steel by the chemical reduction of iron ore using an integrated manufacturing process. The iron from the blast furnaces is converted to steel in a Basic Oxygen Furnace (BOF) as well as in Electric Arch Furnaces (EAF).

The Basic Oxygen Furnace will be utilized for high tonnage production of carbon steel while the Electric Arch Furnace will be targeted for low tonnage speciality steel. In the Basic Oxygen Furnace process, coke-making and iron-making will precede steelmaking as the main feedstock for the furnaces.

Therefore, the first phase of the project will entail the construction of the following:

- **Lime Kiln**
- **Sintering machine**
- **Blast furnace**
- **Basic Oxygen Fur**
- **Continuous casting machine**
- **Steel hot rolling workshop,**
- **3800m<sup>3</sup>/h oxygen plant,**
- **50,000 m<sup>3</sup> blast furnace gas tank**
- **30,000 m<sup>3</sup> basic oxygen furnace gas tank**
- **Air compressor station**

The first phase of the project is expected to produce over 600 metric tonnes of steel per annum.

The project is expected to produce the following products which will be supplied in the local, regional and international markets:

- **Hot Rolled Coils/Plates**
- **Cold-rolled products,**
- **Cold rolled annealed & galvanized coil**
- **Tinplates**

Speaking at the groundbreaking ceremony of the first phase of the plant, the Minister of Mines and Mining Development Hon Winston Chitando said the iron and steel project which has a life of mine of over 100 years will fetch an annual revenue of US\$10 billion for the country in the process contributing significantly to the upper middle-income economy.

"This park will process 10 million tonnes per annum of carbon steel which at today's price, we are talking of around US\$10 billion per annum.

#### **Expectations from the Public**

According to the country's Vice President Dr Constantino Guvheya Chiwenga, the project should adhere to the laws of the country in its operations and embark on corporate social responsibility.

"Dinson Iron and Steel Company must follow all applicable regulations when conducting mining activities, including environmental protection, community development and other social cooperate responsibility across the country," the Vice President said.

According to the country Mnangagwa since Tsingshan is one of the largest steel producers in the world. The country was therefore leveraging the experience that the company has in the steel industry to ensure a successful steel industry in Zimbabwe.

"Steel production is quite critical in the development of any nation, particularly in infrastructure development. This project, therefore, dovetails well with the Second Republic's massive infrastructure development drive as we seek to revamp and modernize our infrastructure for the benefit of our people. This project, in addition to the ZISCO Steel project which is set to be revived, will produce steel not only for the domestic market but will also service the whole Southern African region and global markets thereby generating foreign currency through exports," the President said.

#### **Dinson Iron and Steel CSR projects**

Besides iron ore mining and steel production, DISCO is constructing enabling infrastructure that includes dams, roads, bridges, power transmission lines, schools, communication networks, accommodation and health facilities among others, which will benefit the local communities and the general populace of the country. Some of the projects being

undertaken by DISCO which will benefit thousands of Zimbabweans include the following:

Dam construction near the steel plant along the Munyati River. Besides the construction of a dam for the steel project, the local community will have full access to the dam for their utilization as a source of energy, irrigation and drinking water for both humans and livestock.

#### **Road network**

Construction of the road and bridge which links Mvuma and the steel plant will be widened and tarred. This will benefit the local communities for mobility and efficiency in the movement of goods and farm produces and for the traffic volumes for the new town.

#### **Construction of power transmission line**

DISCO is set to construct a 600 kV power transmission line from Kwekwe to Mvuma. This big power project will not only benefit DISCO as a company but the whole of Mashonaland East and Midlands Provinces with adequate if not sufficient dedicated electricity.

#### **Network coverage**

DISCO has already engaged network service providers to set up new base stations and upgrading of the existing ones. Project work schedules for the erection of more communications towers were signed and more people within the area will benefit from this project.

#### **Services and Infrastructure (New Smart Town)**

DISCO is in the process of developing a master plan for a new town with modern infrastructure and modern social amenities.





# The importance of including CSR in the Mines bill



**T**he inclusion of Corporate Social Responsibility (CSR) in the Mines and Minerals Amendment bill is of utmost importance as this will ensure that communities fully benefit from the extraction of resources found in their areas.

Currently, in Zimbabwe, there is no particular law that governs CSR, this means that majority of companies that are engaging in CSR initiatives are doing it out of their own free will.

The failure of the government to have a law that mandates miners to practice CSR has seen most mining communities living in abject poverty while mining firms would be reaping huge profits and at the same time destroying the future of the environment.

Chinese-owned mining operations in Zimbabwe and the Artisanal and Small Scale Miners (ASM) have been accused of only extracting resources without giving back to the communities in which they would be mining.

Globally, CSR within the mining sector has evolved to become a central part of mine-community relations. Mining companies now accept that the communities affected by their operations need to have basic services like water, health care, electricity and sanitation. Developing a mine presents an opportunity to improve conditions within these communities and unless the community benefits, the mine

risks becoming an enclave.

## What is CSR?

CSR is the continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as the community and society at large.

According to ISO 26000, social responsibility is not merely a "neutralizing" action applied at the end of production/distribution to fix what has been generated or displaced. Rather, it is a proactive mindset that should be incorporated across all levels of planning, execution, and stakeholder interaction.

In ISO 26000, social responsibility is described as a multi-faceted approach that, like quality, should be integrated into all as-

pects of how a company conducts its business.

## Reasons for undertaking CSR

Reasons for undertaking CSR in communities are many ranging from moral and ethical to mere responsibility. Mining companies cause social problems such as environmental degradation, and pollution among others hence have a responsibility to solve those they have caused to prevent further social problems from arising. Hence corporations cannot escape responsibility for those impacts, whether they are positive, negative or neutral. Corporations rely on the contribution of a much wider set of constituencies or stakeholders in society (such as consumers, suppliers, and local communities), rather than just stakeholders as well as those of shareholders.





## Why Should CSR be included in the Mines bill?

According to the Chairperson of the Parliamentary Portfolio Committee on Mines and Mining Development Hon Edmond Mkaratigwa, the Mines and Minerals Amendment bill will include ideas that are going to force mining companies to undertake CSR.

"There are a number of ideas but the loud and clear message is that CSR must be made part of our enforceable laws. Ideas are that whatever promises made before project implementation should be followed up and come to fruition. Also, the road network that they use should not be left worse off after extraction. There are many issues and these include contributing to local Trusts and facilitating such to ensure community and investor harmony. It should be further noted that these issues we appear to be forcing on investors may in the near future become a norm as competition shall rise and when such issues we are always raising may become part of the natural selection criteria of investors, as competition rises. Zimbabwe is not static, it is reasserting itself and it is important that investors heed to this call. Key advocacy points we

have raised are transforming from mere Corporate Social Responsibility to Corporate Social Investment. Something that leaves sustainable benefits than something that legitimizes the resource curse outcomes common in many other developing countries. Ours is a leap forward and cascading benefits through possible local market enhancement so that we broaden our economy from over dependence on staples," Mkaratigwa said.

## Debate - People are more interested in community development

After Mining Zimbabwe published an article about the Manhize project producing us\$10 billion there was a debate on community development with many saying as long as communities are not benefitting, these projects are useless to the common man.

"It's not a matter of a certain figure being made, but whether it's going to be available for the development of our country and the general populace," a Mr Sibanda said.

Major projects in chrome, gold, diamonds, manganese, copper, platinum etc arikuitwa asi zvirikungobaya instead of

boosting government coffers and raising the living standards of our people," another said.

There is however some acknowledgement of improvements being witnessed in the country mainly some of the countries once death trap highways which can be linked to the steady growth of the mining industry.

## Conclusion

Although mining companies like Zimplats, Mimosa, Unki, Caledonia, and Kuvimba Mining House among others have been leading in CSR, there is a general concern that a law governing CSR should be enacted to prevent mines from extracting without any responsibility.



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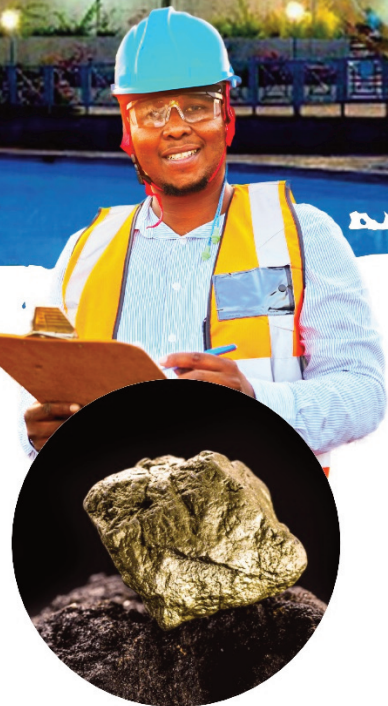






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# Favorsea

## Committed to Mining Safety

**S**afety in mining is all of our concern and great strides have been made by mining industry employers as well as regulatory bodies to see this through. Globally, the Vision Zero campaign has integrated the approach to prevention under the banner of "safety, health, and well-being" at all levels of work.

With the widespread commitment to mining safety, collision avoidance systems (CAS) by way of proximity detection systems (PDS) are one such way of avoiding harm to people and property in mines. Favorsea Africa plays a pivotal role in the supply of machinery and technologies for both underground and open-pit mining throughout the globe.

In South Africa mining safety regulations have been under scrutiny since 1996 with the inception of the Mine Health and Safety Act (MHSA), and the 2015 amendments to the Chapter 8 regulations – which address the safe use of diesel-powered trackless mobile machinery (TMM). This legislation first necessitates that companies, based on an approved risk assessment, implement an automatic detection system, which can audibly/visually warn operators of an imminent collision (Level Seven Intervention). The second part stipulates that there must be some sort of automatic intervention by the system to prevent a collision if the operator fails to act and that the TMM must failsafe, if necessary (Level Nine Intervention).

With a system that is both easy to use for the operator, and provides real-time visibility and reporting for the back office it exceeds in making the mining environment safer. With Level Nine Intervention control over machinery; it is this intervention that allows for optimal safety controls on site. The system will initially send warning sounds to the operator and eventually automatically slow down the machinery. The system alerts the operator about other vehicles, obstacles, and personnel around it.

With Favorsea Africa's mining safety



solutions you can address mining safety concerns such as fatigue detection, and blind spot monitoring which prevents operator fatigue and mining accidents and incidents. The Favorsea Africa CAS incorporates GPS positioning, radio frequency (RF) technology and artificial intelligence (AI) camera's. Multiple radars detect any physical obstruction and relay data about the size and speed of the obstruction or approaching vehicles to the CAS. The software uses an algorithm to determine whether the machines are on a collision path and to take the appropriate action within milliseconds if the operator fails to do so. Favorsea GM Innocent Chimunhu noted that the company could also enable a failsafe mechanism if a client requests it. Further, the system's parameters (range up to 100 m) for Level Nine and are determined by the risk assessment done

on-site. Geofencing can be used in certain areas, for example, in the pit or on an access road to prevent entry to high-risk areas.

Mineworkers and visitors will use GPS tags. Non-mining vehicles will make use of a portable system to allow full functionality of the system on-site.

The CAS can be installed onto older 'non-intelligent vehicles making the technology more accessible to operators and junior miners who might not necessarily have the capital to buy some of the latest model TMMs but still need to comply with the regulations. Another added benefit is that the system interfaces directly with OEM Canbus. The system has been proven to avoid accidents and incidents in various real-life scenarios: a head-on collision with both trucks accelerating toward each other, one truck accelerating towards a stationary vehicle, trucks approaching an intersection, and a queuing scenario.

As Favorsea Africa recently achieved ISO 9001 certification in Quality, Occupational Health, and Environmental Management - you can rest assured that your investment is in reputable hands and ensures that you are continuing with your daily operations.

Now more than ever, it makes sense and cents to invest in technologies that will keep mining employees as well as mobile equipment safe.



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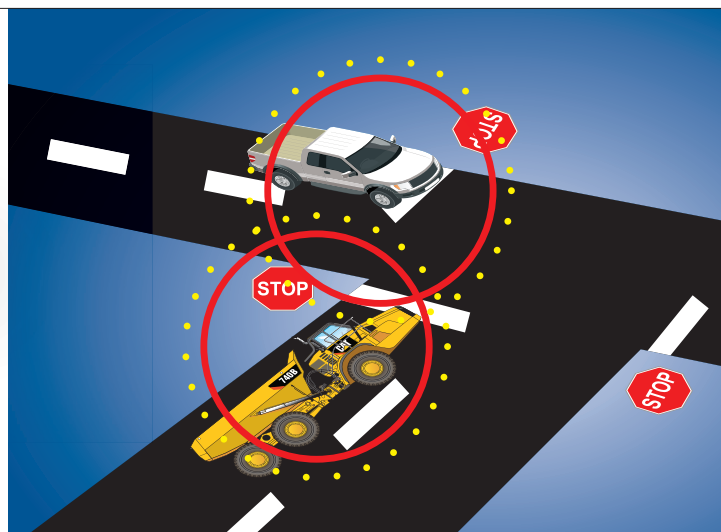
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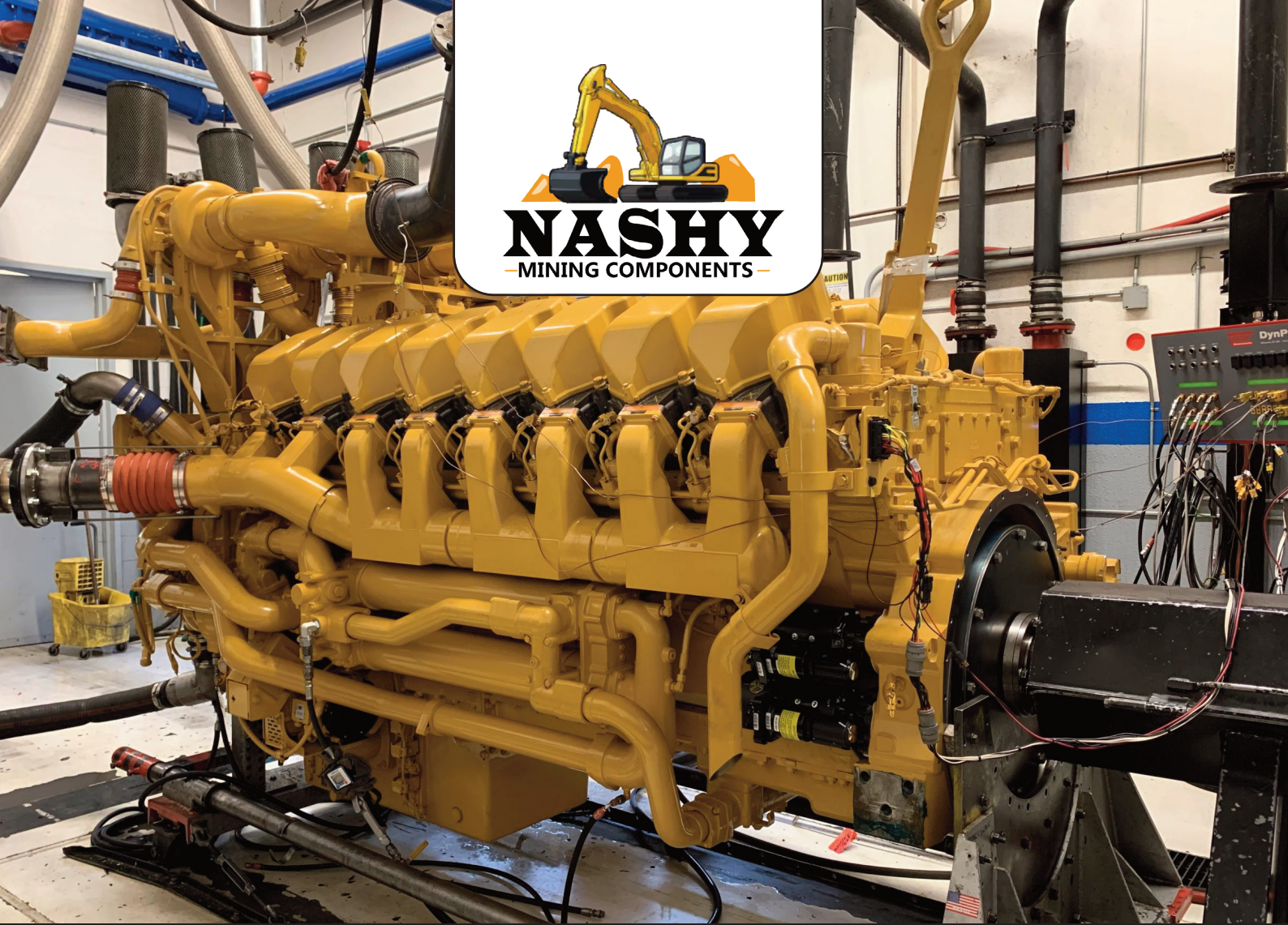
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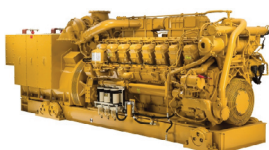
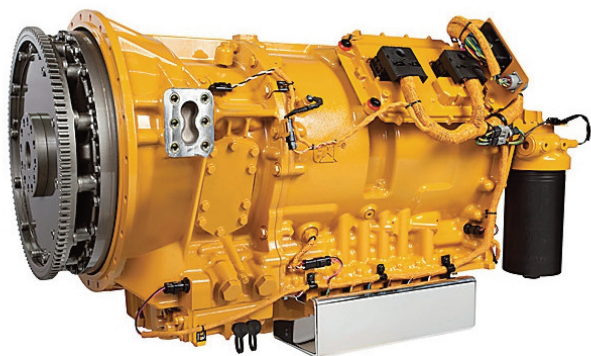






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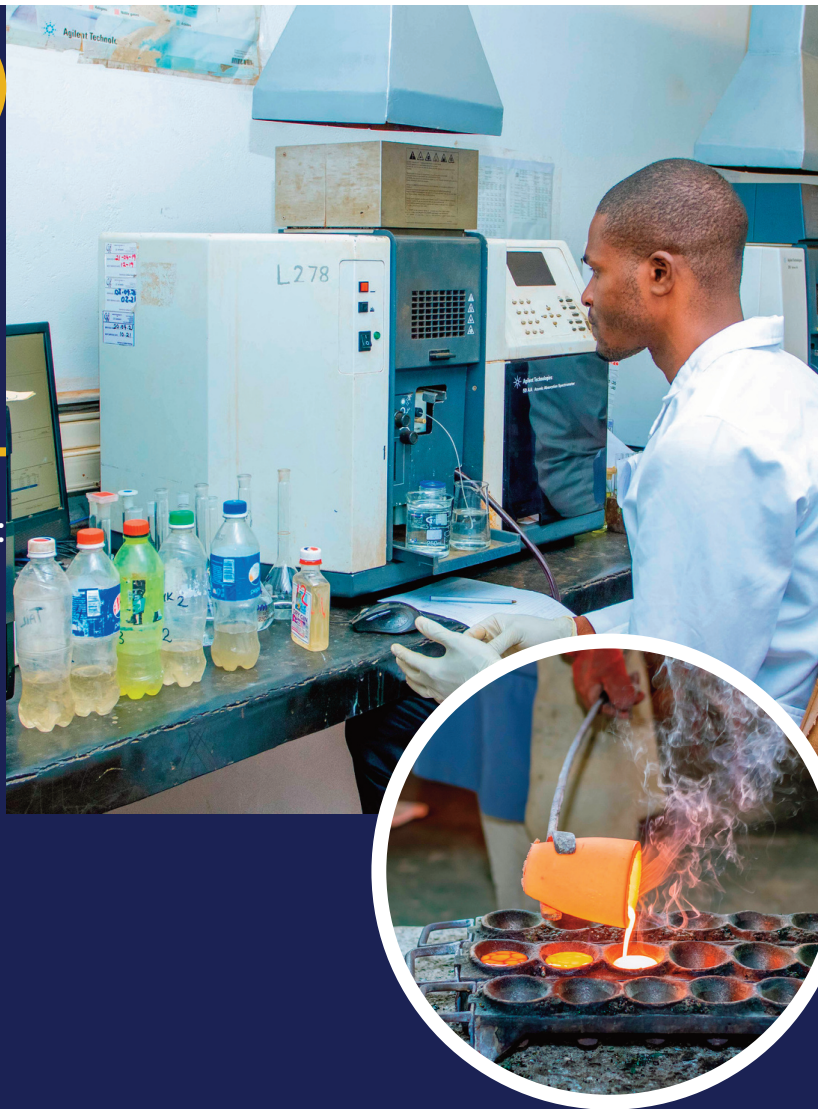
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# COVER:

A dump truck and excavator at  
Eureka gold mine in Guruve





## Mining Fetches US\$6.8 billion first 9 months

**T**he mining industry which is expecting to fetch at annual revenue of US\$8 billion by the end of the year has earned nearly US\$6.8 billion during the first nine months of the year, a government official has said.

Rudairo Mapuranga

In an interview with Mining Zimbabwe, the Deputy Minister of Mines and Mining Development Hon Dr Polite Kambamura said the government is well assured that the projected target to fetch a revenue of US\$8 billion from Mining is achievable as the sector has already earned a revenue of around US\$6.8 billion from January to September this year.

"For this year the target is very much achievable as we can say, was around US\$6.8 billion by the end of September so we are very much on track," Dr Kambamura said.

Although the government is targeting to fetch an annual revenue of US\$8 billion this year, the overall target is for the mining sector to fetch an annual revenue of US\$12 billion by the end of 2023.

The mining sector has been the mainstay of the country's economic recovery and growth contributing significantly to export receipts for many years.

The sector has been on a growth path, rising from US\$2.7 billion in 2017 to US\$5.2

billion in 2021 with the hope of the sector achieving US\$8 billion in 2022 due to increased production, value addition and beneficiation of minerals such as gold, PGMs, chrome, coal among others.

Under the US\$12 billion mining roadmap, gold is expected to contribute US\$4 billion, platinum US\$3 billion, while chrome, iron, steel, diamonds and coal will contribute US\$1 billion.

Lithium is expected to contribute US\$500 million while other minerals will contribute US\$1,5 billion.

The mining industry, the largest earner of foreign currency, is critical to Zimbabwe's economy and the Government forecasts that by 2030, it will be generating over US\$20 billion.

**Government estimates that by 2030, mining will be generating over US\$20 billion.**

The mining industry currently generates more than 75 per cent of the country's total forex receipts while 2021 figures proved that the industry would be key in the journey towards the realisation of Vision 2030.

Economic analysts have commended the government for creating an enabling mining environment through incentives which have improved gold production in the first half of the year.

The mining sector is one of the economy's strategically key productive sectors expected to account for the largest contribution to the gross domestic product growth in the short to medium term.

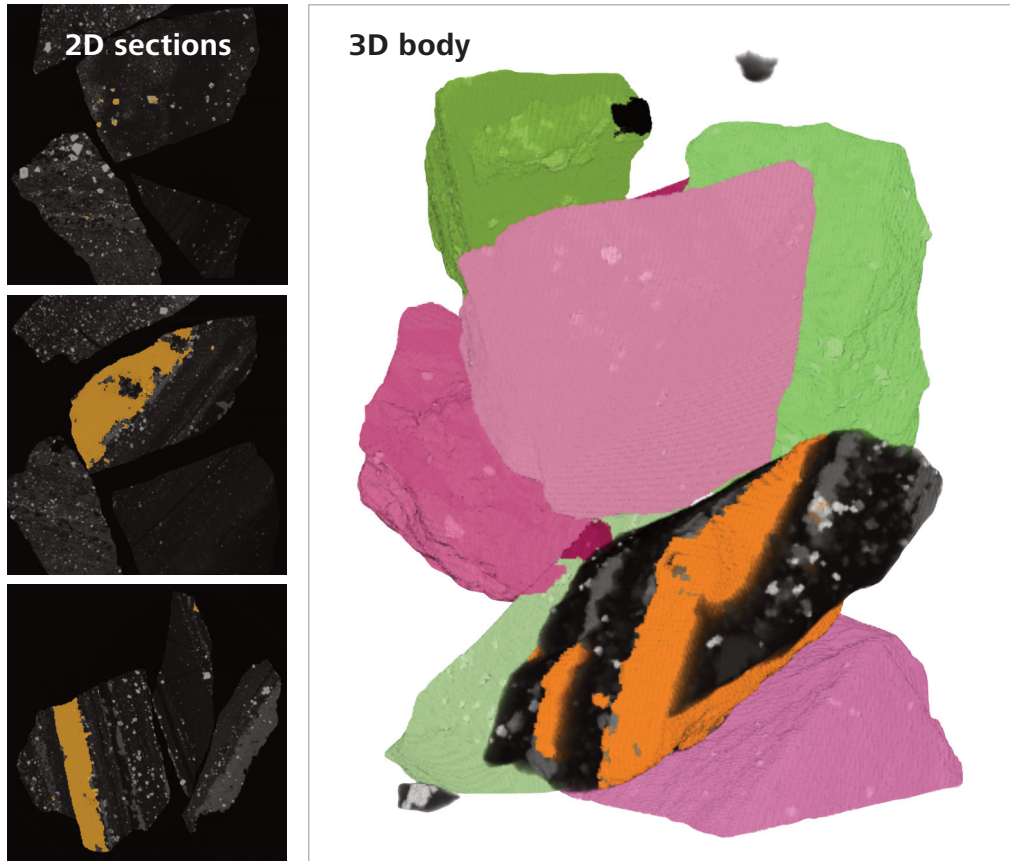
To that end, the government introduced incentives for gold and other precious metals, which have played a significant role in increasing productivity and putting a fatal blow to the scourge of stemmed smuggling.

Analysts also are optimistic that with production incentives put in place by the government, the economy is well on course to reach its potential.





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Seeing beyond



# HWANGE COLLIERY

## RECORDS 52% PRODUCTION INCREASE

**Z**imbabwe Stock Exchange-listed coal mining company Hwange Colliery Company has recorded a 52 per cent increase in production with sales volumes increasing by 74 per cent during the first half of the year.

According to Hwange Colliery Company, despite an increase in production, limited availability of spares and the general increase in prices of maintenance spares and consumables affected the operations negatively.

"The Company's production increased by 52% during the period under review. The sales volumes, however, increased by only 74% compared to 2021. Limited availability of spares and the general increase in prices of maintenance spares and consumables affected the operations negatively as a result, underground coal production decreased.

"3 Main Underground Mine coal production was 19.49% lower than the previous year. This was mainly due to ageing underground mining equipment. The strategic plan is to have two new continuous miners within the next 18 months. This will result in the company's underground mine reaching optimum production capacity. The first continuous

miner is expected to be commissioned before the end of this year," the company said.

According to the company, production at its open pit mines increased by over 50 per cent as compared to the comparable period of last year.

"Total coal mined by Opencast operations was 1 288 521 tonnes, a 55.59% increase in production from the previous year. The steady production is mainly attributed to the successful contract mining model the company has employed. A total of 676 387 tonnes of coal was produced for Hwange Power Station and Zimbabwe Zhongxin Electrical Energy for electricity generation during the course of the year, which was a 124% increase from the previous year. Deliveries into the power station were however negatively affected by limited stock holding space in the power station.

"The average feed recoveries for HCCL dry screening and wet screening plants were 98% and 90% respectively. Coking coal recovery from Jig & Floatation and HMS plants was 70% of plant feed. The company needs to improve its current washing capacity, as both the HMS plant and the Jig and Floatation plant are outdated and need constant maintenance and repair. This has put pressure on the company's

limited working capital. The company intends to have modular plants and washing plant located near the mining areas within the next 24 months," the half-year results for the period ending 30 June 2022 reads.

### Safety, Health, Environment and Quality

HCCL experienced a fatality-free shift record as at 30 June 2022. The lost shift injury frequency rate improved due to initiatives like people focus, systems implementation and technology embracing. HCCL embraced a risk/opportunity-based approach to operations aimed at zero harm. Top risks included Acid Mine Drainage, for which an Environmental Management Plan (EMP) to manage its effects is now in place. Likewise, robust measures aimed at reducing similar incidents related to non-communicable diseases were established through a Wellness Policy.





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# Zimplats

## earns more from Palladium again

**D**espite its annual revenue from minerals declining by over 8 per cent, Palladium continues to be Zimplats' biggest annual earner, fetching nearly US\$0.5 billion during the financial year ended 30 June 2022.

Rudairo Mapuranga

According to figures from Zimplats' 2022 Annual Financial Statement, although palladium continues to be the group's biggest mineral earner, its revenue declined by 9.4 per cent to US\$451 929 000 from US\$498 851 000 generated by the mineral the previous year. The overall group's revenue declined by 8.17 per cent to US\$1 243 140 000 in 2022 from US\$1 353 792 000 generated the previous year.



The group's Annual Financial Statement shows that Rhodium (despite its revenue declining by 29.13 per cent to US\$312 045 000 in 2022 from US\$440 305 000 in 2021), is Zimplats' second biggest earner.

The third revenue earner for the group during the Financial Year ended 30 June 2022 was Platinum with its revenue increasing by 1.1 per cent to US\$ 248 799 000 from US\$246 057 000 earned by the metal the previous year.



Nickel, the group's fourth biggest mineral revenue earner, increased its portfolio by 74.5 per cent during the financial year ended 30 June 2022 to US\$ 110 974 000 from US\$ 63 587 000 earned by the metal in 2021.

Gold revenue for the Platinum Group Metal producer increased by 15.6 per cent

US\$57 660 000 in 2022 from US\$49 889 fetched the previous year. Gold is Zimplats' fifth biggest mineral revenue earner.

The group's sixth biggest earner during the Financial Year ended 30 June 2022 was copper which increased its contribution by 28.9 per cent to US\$30 180 000 from US\$23 419 000 in 2021. In 2021 copper's revenue was behind Iridium which fetched US\$25 000 000 however, its contribution this year declined by 7.5 per cent to US\$23 135 000.

Ruthenium revenue increased by 23.3 per cent during the Financial year ended June 2022 to US\$7 337 000 from US\$5 949 000 earned the previous year, Zimplats' financial report shows.

Silver contribution to Zimplats fiscus during the Financial year ended 30 June 2022 according to Zimplats 2022 Financial report decreased by 9.2 per cent to US\$374 000 from US\$412 000 earned the previous year. Cobalt revenue increased by 118.9 per cent to US\$707 000 during the Financial year ended 30 June 2022 from US\$323 000 fetched the previous year.



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ISSUE 02



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